A work project, presented as part of the requirements for the award of a masters degree in Economics from the Faculdade de Economia da Universidade Nova de Lisboa

Effects of a monetary union on a small peripheral country: Stabilization and competitiveness in Portugal

Henrique Moreira da Silva de Oliveira Castro
student number 242

A Project carried out on the internationalization and development area with the supervision of: Maria Cristina Corado

7/06/2010

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Abstract

The first decade of the 21st century introduced the euro in Portugal. This step towards European integration implied that Portuguese economic authorities lose monetary independence. We investigate the impact of that loss in Portuguese competitiveness through the construction of competitiveness indicators, and on current account dynamics trough a decomposition of the current account. Despite the continuous loss of competitiveness after 1999, empirically we don't find evidence that the euro is contributing to it. We do find evidence that current account adjustment pattern changed after 1999.

Keywords: Monetary Union, Competitiveness, Current account, adjustment

I want to thank my advisor, Maria Cristina Corado, for all the dedication and effort she put on helping me to develop this work project.

Introduction

European History is one of conflict. For centuries, religious wars, power struggles and iron curtains have been a constant in Europeans lives. However, in the aftermath of World War Two, aiming at continental peace some European countries started an ambitious project of economic integration, culminating in the formation of a monetary union. The single currency, the euro, has been in circulation since the 1st of January of 2002, initially in a group of twelve countries that was later enlarged by other four.

The level of economic integration Europe enjoys presently was fruit of a long and gradual process. The result is that European citizens enjoy a level of economic welfare, political union and internal peace only comparable to the one felt during the existence of the Roman Empire. Still there is something unique about the actual union: it was achieved peacefully and voluntarily by its members.

On this work we will study the last step of economic integration, monetary union. It's usual to pose the question: why should a country relinquish its own currency, and share another currency with a group of countries. The answer is obvious: there are benefits in taking such a step. Not so obvious is what these benefits are. Skimming the monetary union literature we can get a rough idea of these benefits.

The most obvious gain in joining a monetary union is the elimination of transaction costs among its members. The European commission estimates these gains to be between 0,25% and 0,5% of the Eurozone GDP. This may seem irrelevant, but it should be noted that transaction costs are a distortion, and eliminating them has other indirect benefits.

One of them is price transparency. In a monetary union consumers can observe prices expressed in the same currency across borders, if we add this to the absence of transaction costs we expect an increase in competition. This should result in lower prices for the consumer.

Another indirect gain from eliminating transaction costs relates to the elimination of uncertainty about exchange rates. Less uncertainty about future allows firms to better allocate resources. Basically, eliminating a source of risk reduces uncertainty and should improve social welfare.

Also, there is a point to be made concerning economic growth. Assuming that by eliminating exchange rate risk we reduce systemic risk, we know that investors will demand a lower risk premium for the same investment. This will lead to lower real interest rates, to higher investment and to an expansion of the capital stock leading to economic growth.

There are other less relevant benefits from entering a monetary union. First the new currency is likely to find bigger use out of the union, becoming a more international currency. This brings advantages for the issuer, such as additional revenues and expansion of the central bank balance sheet. As an example, the central bank can issue more currency to finance for the budget deficit, and foreigners will be willing to pay for it. Also an international currency is likely to boost activity for the domestic financial markets.

These are the most important benefits of a monetary union. We can summarize them in two points: First, they happen mainly at the microeconomic level, by improving efficiency; Second, they are bigger the more open to trade and the more integrated are the member economies. An important question that I will not approach is whether a monetary union fosters further integration between member economies, or not. The answer holds the key to know if it's worth "investing" in forming a monetary union when benefits aren't bigger than costs.

Concerning the costs of a monetary union, these derive from the loss of several instruments of economic policy. By abandoning its currency and joining a monetary union, a country is no longer able to change its exchange rate, neither to determine the stock of money circulating or setting the interest rate. These instruments are not a source of long run growth, but they are an important instrument of stabilization and adjustment. These adjustment instruments will be in the hands of the union central bank, which has to use them for the monetary union as a whole. It won't be possible to discriminate different monetary policies for union members.

This loss of policy autonomy is in the core of the costs associated with belonging to a monetary union. If countries face asymmetric shocks, and need different types of adjustment, the union's central bank can´t perform the desired adjustment through monetary policy.

The famous example stated by Mundell (1961), focus on an asymmetric demand shock in two regions with the same currency. One would need expansionary monetary policy, while the other would need it to be contractionary. Thus, the central bank is unable

to perform an adjustment on the whole economy through monetary policy.

Mundell noted that if the affected countries have perfect labor mobility between each other, shocks will be followed by migration, weakening or strengthening demand, leading to adjustment. Another mechanism of adjustment is wage flexibility. If wages are completely flexible, they will either go down if the shock is negative, or up if it's positive, bringing back the economy to equilibrium.

Kenen (1969) noticed that the costs of entering a monetary union are greater the more specialized is the production of an economy. The more specialized is an economy, the more likely it is to suffer large and asymmetric shocks.

According to McKinnon (1963), the exchange rate is less useful the more open is an economy. This logic relies on the observation that very open economies cannot change competitiveness by devaluing its currency. In very open countries trade competition equalizes relative prices in international markets, and a country can't affect its goods relative prices anymore. This means that very open and small economies don't lose much stabilization power when they lose their exchange rate.

An important mechanism that might mitigate the negative effects of monetary union is the existence of cross country redistribution schemes in the presence of asymmetric shocks. This redistribution should promote the adjustment to shocks inside the union, minimizing the negative effects of asymmetric shocks.

There are many other issues related to the costs of a monetary union. However, according to the literature the mentioned costs are the most important. We can summarize them as we did with benefits: Monetary union costs happen mainly at the macroeconomic level and correspond to increased difficulties in stabilizing the economy in the presence of asymmetric shocks. Those difficulties are bigger the more rigid is the union's labor market, the more specialized are the economies that belong to the union, the more closed are the economies and the less redistribution schemes exists across economies. Just like with benefits, it would be of extreme importance to know the effects that belonging to a monetary union has on matters such as the level of specialization, labor market rigidity and business cycle synchronization.

This work will focus on the costs of becoming part of a monetary union for a small peripheral country, in terms of macroeconomic adjustment, and management of competitiveness. We chose to study two countries, Portugal and Ireland. To carry

that analysis, we used a technique to decompose and identify the dynamics of the current account. This technique allows observing the composition of shocks and their impact on the current account, and also the adjustment path and its composition. We carry out a comparison for the period after and before joining the monetary union, to look for differences in adjustment.

In addition, we also estimate several competitiveness indicators, and sketch their evolution in the period before and after adopting the euro. The purpose is to observe if the loss of the exchange rate instrument was reflected in the evolution of competitiveness for both countries. Also, we make an attempt to empirically estimate the determinants of competitiveness.

Competitiveness indicators

One of our aims was to estimate and quantify the evolution of competitiveness in Portugal. This is crucial to understand the effects of the single currency on the Portuguese economy. There is a widespread argument favoring the idea that the euro is causing a loss of competitiveness on the Portuguese economy. It is a fact that Portugal lost control over its exchange rate, but in the long run we doubt of the effectiveness of that instrument as a means of becoming more competitive. Thus, we also doubt of the former argument. The purpose of computing different indicators of competitiveness was to compare the evolution of competitiveness in different measures. The same indexes were built for Ireland, for comparison purposes.

Some competitiveness indicators are a relative measure, in the sense that they are calculated against other country or basket of countries. We assumed that Portuguese bigger trading partners are its biggest competitors, so we calculated the indicators against them. The criterion to choose which countries are the bigger trading partners was simple: the countries that weight more in the Portuguese current account, and that together amount to roughly 70% of Portuguese transactions are the biggest competitors. Table 1 shows the chosen partners for Portugal and Ireland, the weights are not in percentage of the current account weight, but are only in percentage of the total basket weight(Portuguese bigger trading partners weighted 70.47% in the total current account, while Irish partners weighted 68.9%).

Table 1 – Portuguese and Irish trading partners

Country	Spain	Germany	France	U.K.	Italy	Netherlands	USA	Belgium	Total
Portugal	40.1%	18.08%	13.66%	7.15%	6.96%	5.35%	4.67%	4%	100%
Ireland	-------	11.76%	7.17%	34.4%	5.08%	5.73%	22.60%	13.22%	100%

We calculated 4 aggregate indicators of competitiveness for both countries: relative consumer prices (*ECPI*), relative price of traded and non-traded goods (*E*), relative unit labor costs (*RULC*) and relative unit costs (*RUC*). We also calculated a weighted average of bilateral nominal exchange rates (*En*), used in 2 of the 4 measures. We now briefly describe the construction of the indicators, and as we will see, they all tell us different things.

ECPI was calculated according to the following formula:

(1) $$ECPI = En + CPI^{*} - CPI$$

Where *En* is the weighted nominal exchange rate, *CPI** is the weighted foreign price level, and *CPI* is the domestic price level, all in percentage changes. In the Portuguese case where the majority of trading partners share the same currency, *En* loses its importance. Thus, *ECPI* will mostly reflect differences in inflation rates. This reinforces the importance of inflation control inside a monetary union in order to manage competitiveness.

The relative price of tradable and non tradable goods, *E*, was calculated according to:

(2) $$E = En + Pt^{*} - Pn$$

Where *En* is again the weighted nominal exchange rate, *Pt** is the price of traded goods, and *Pn* is the price of non traded goods, all in percent changes. *Pt** was calculated by aggregating traded goods into a composite good. *Pn* was assumed to be the same as nominal unit labor costs, since non traded goods are usually services, whose inputs are mainly labor. This concept measures differences between external and internal market prices, adjusted by the nominal exchange rate.

Concerning *RULC*, the construction of the index was easier, since the needed indexes were already computed in the European commission database. We used the real unit labor cost index. It was just needed to weight the indexes of partner countries, and

build a composite *RULC*, suited for direct comparison with the Portuguese and Irish one that can be seen in the annex.

Relative unit cost, *RUC*, was the most difficult index to compute. Its construction is explained in the annex. Intuitively, the index measures labor costs and capital costs together. However, it's conceptually different from *RULC*, in the sense that it measures the evolution of unit costs, but does not adjust them for productivity. As a result the index is, in normal conditions, always growing. The index is expected to decrease or decelerate, when Portugal started to benefit from lower interest rates, due to the entrance in the eurozone, in the previous years to 2000. Given that lower interest rates mean lower capital costs.

We show in table 2 and 3 the evolution of the mentioned indicators for Portugal and Ireland.

Table 2 –Portuguese indicators of competitiveness (period averages at annual rates)

	En	E	ECPI	RULC	RUC
1977-1985	17.81%	19.22%	4%	-4.27%	----------
1986-1990	4.25%	-0.93%	-3.04%	-0.95%	11.79%
1991-1995	1.9%	0.21%	-1.27%	1.26%	12.7%
1996-2001	2.14%	1.61%	1.41%	0.45%	5.69%
2002-2005	-2.03%	-3.42%	-2.48%	-0.14%	6.57%
2006-2010	-1.75%	-2.44%	-1.60%	0.75%	6.45%

Table 3 – Irish indicators of competitiveness (period averages at annual rates)

	En	E	ECPI	RULC	RUC
1977-1985	2.63%	2.95%	7.69%	-0.83%	----------
1986-1990	-3.58%	-6.76%	3.5%	-1.07%	4.55%
1991-1995	-0.03%	-1.26%	3.31%	-1.16%	1.67%
1996-2001	3.7%	1.72%	1.86%	-2.48%	4.32%
2002-2005	-3.4%	-4.11%	1.9%	0.17%	9.24%
2006-2010	-3.09%	-2.71%	1.69%	1.73%	13.31%

When analyzing the tables we must take into account that 2010 is a prediction. Also, when computing *RUC* several years weren't available (from 1977 to 1985 and 2009 to 2010). As a rule of thumb, a country gains competitiveness whenever *En*, *E or ECPI* goes up, or *RULC* and *RUC* go down.

Summarizing the Portuguese indicators evolution, the best periods were 1977-1985 in all indicators (except for RUC where it's not available and where the best period is 1996-2001). The reason lies in the fact that during this period, there were two liberalization and stabilization packages conducted by the IMF. This packages included, among others, nominal depreciations, wage restraint and inflation reduction. These measures are susceptible to greatly influence all indicators.

For *E* and *ECPI*, the second best period, was 1996-2001. In this period, Portugal was preparing to adopt the Euro and measures such as exchange rate stability and inflation reduction were required. *E* and *ECPI* are very influenced by exchange rate movements and inflation differentials. From 2002 onwards, when the euro came into circulation, both measures attain 2 of the worst scores. This suggests that the euro might have brought some difficulties in managing price competitiveness. Nevertheless, Ireland performs worse than Portugal in *E* after adopting the euro.

However, if we look at *RULC* and *RUC* the story is different. Concerning *RULC*, Portugal actually performed well in the first 3 years the euro came into circulation. Still, after 2006 the performance was slightly negative, which can be a symptom of internal recession first, and world recession later. Again, after 2001 Ireland performs worse than Portugal in this indicator.

Finally, Portuguese *RUC* seems to stabilize around 6.5% after 2001. It's an almost identical performance to the weighted basket of Portuguese selected trading partners. After 2001 Ireland performs worse again. The numbers and graphs for both countries and their trading partners can be found in the appendix.

Another interesting topic concerning indexes is the relation between some of them, especially relative consumer prices and real exchange rates. Following Macedo and Corado (1989), we define:

(1) $CPI = a \cdot Pn + (1 - a)(En + Pt^*)$

(2) $CPI^* = a^* Pn^* + (1 - a^*) Pt^*$

(3) $ECPI = En + CPI^* - CPI$

(4) $$E = En + Pt^* - Pn$$

Where a and a^* are the domestic and foreign weight of non tradables respectively. Pn and Pn^* are the price of non-tradables at home and abroad respectively. En is the nominal exchange rate. Pt^* is the price in foreign currency of a good that results from aggregating all traded goods into a composite good. All in percent changes.

Substituting CPI and CPI* into ECPI and developing we can reach the following expression:

(5) $$E = \left(\frac{1}{a}\right) \cdot ECPI + \left(\frac{a^*}{a}\right) \cdot (Pt^* - Pn^*)$$

This is of great interest, since it can give us the percentage of traded and non-traded goods in an economy and in its partners. So we attempt to estimate it, first using OLS. The results were very unsatisfying, due to the presence of unit roots and cointegrating relationships between the variables. The first attempted solution was to estimate the equation using first differences, which gives only the short run dynamics. The inconvenience is that short run relationships tell us nothing about the weights of tradables at home and abroad.

Taking this into account, we chose to estimate a Vector Error Correction Model, which gives us both the long run relationship between variables and the short run dynamics. We present the long run relationship for Portugal:

(6) $$E = -5.7 + 2.35 \cdot \text{ECPI} + 1.23 \cdot (\text{Pt}^* - \text{Pn}^*)$$

This means that the average proportion of non tradables in the Portuguese economy for the years 1983-2010 has been of a=42% while for our partners has been of a*=51%. This makes sense, since our main partners are more developed economies, and should have greater proportion of services in their economy.

In the case of Ireland we estimated the same equation, with the same number of lags and cointegrating relationships and obtained the following results a=65% and a*=80%. Irish results might be exaggerated, since we estimated Irish weights with the same model that we used for Portugal. The chosen model was optimal for Portugal, in terms of lags and cointegrating relationships, but it might not be for Ireland. Nevertheless the numbers make some sense, since Irish bigger partners USA and UK

have bigger proportion of services in their economy than for example Spain, which is the biggest Portuguese partner.

For an estimation of the determinants of competitiveness, and effect of monetary union on competitiveness, check the appendix.

Current account dynamics

This section investigates the effects of shocks on the Portuguese and Irish current accounts, and the corresponding adjustment. We use a current account decomposition, used by Macedo and Corado(1989) adapted from Balassa(1981).

The technique works in a simple way: we decompose the current account into external shocks and policy responses to isolate different types of shocks, and to see how the economy adjusts through policy responses. Specifically, we assume a base year for the current account, from that period onwards we compute trend variables and hypothetical variables that we compare with the actual values, allowing to account for shocks, their nature and their magnitude. I will briefly illustrate the decomposition of the current account used. We depart from the current account deficit in the base period, given by:

$$R_0 = M_0 - X_0 - S_0 + J_0 \tag{8}$$

Where R is the current account deficit, M is imports, X stands for exports, S is services and transfers, J is interest paid on foreign debt and the subscript indicates the period. Thus, we can represent the current account deficit in any period t by:

$$R_t = M_t(1+Pm) - X_t(1+Px) - S_t + J_t \tag{9}$$

Where Pm and Px are the import and export price changes in percentage, in relation to the base period. The next step is to take the difference between equation (1) and (2). This results in:

$$\begin{aligned} R_t - R_0 &= (M_t Pm - X_t Px) + (M_t - M_0) - (X_t - X_0) \\ &- (S_t - S_0) + (J_t - J_0) \end{aligned} \tag{10}$$

If we introduce hypothetical exports *(XH)* and trend exports *(XT)*:

$$(R_t - R_0) + (X_t - XH) = (M_t Pm - X_t Px) + (M_t - M_0) - (X_t - X_0) - (S_t - S_0) + (J_t - J_0) + (XT - XH) - (XT - X_t) \quad (11)$$

The meaning and how trend and hypothetical variables were calculated is explained below. We can introduce in the equation hypothetical imports *(MH)*, trend imports *(MT)*, trend interest payments *(JT)* and skip some steps, yielding:

$$(R_t - RT) + (X_t - XH) + (MH - M_t) + (MT - MH) = = (M_t Pm - X_t Px) + (J_t - JT) + (XT - XH) \quad (12)$$

It's worthy of notice that we removed the services component from the equation, and also all variables expressed in the base period. We have introduced a new variable, *RT*, which is the trend current account deficit. It's given by the values of trend imports, trend exports and trend interest payments

We now give our interpretation of equation (12). We assume that countries are price takers, so they can't influence their import and export prices.

On the right side we have the terms that represent the effects of external shocks. The first term represents the terms of trade effect, the second the interest rate effects, and the third the export volume effect.

On the left side, we have what we call policy responses. The first term represents additional net external financing, the second represents the price effect of export promotion, the third represents price effect on import substitution, and the fourth represents internal product effect on import volume.

Following Macedo and Corado(1989), we can organize variables in the following way:

External shocks are composed by terms of trade effect (13) and export volume effect (14):

$$TOT = M_t Pm - X_t Px + J_t - JT \quad (13)$$

$$EXV = XT - XH \quad (14)$$

Policy responses are composed by demand management (15), price effect of export promotion (16) and price effect of import substitution (17).

(15) $DEM = R_t - RT + MT - MH$

(16) $EXP = X_t - XH$

(17) $IMS = MH - M_t$

We now explain how trend and hypothetical variables were obtained. We needed to estimate income and price elasticities for import and exports. Since most used variables had unit roots and in all equations we detected cointegrating relationships, we opted to estimate them using a vector errors correction model in order to discover the long run relationships. We estimated Portuguese exports to be given by the following regression:

(18) $X_t = -11.46 + 0.55\, PX_t + 1.746\, X^*_t$

Where *Xt* is exports in constant prices, *PXt* is export prices, and *X*t* is trading partners imports in constant prices. Both elasticities are significant at the 1% level.The results for Ireland can be found in the appendix.

Export trends *(XT)* were obtained assuming that the average of the last three years for both regressors (export prices and foreign imports) has been maintained in the current period. Hypothetical exports *(XH)* were obtained using the same process as for export trends, but uses current foreign imports instead of lagged foreign imports. So the term *EXV (=XT-XH)* captures the effect of shocks from foreign demand, while the term *EXP (=Xt-XH)* captures shocks from export prices.

Resembling export estimation, we estimate a regression that explains Portuguese imports in the following way:

(18) $M_t = -4.75 + 1.78\, Y_t - 0.536\, EM_t$

Where *Mt* is current imports at constant prices, *Yt* is GDP at constant prices and *EMt* is an import exchange rate defined as import prices over nominal unit labor cost. Both elasticities are significant at the 1% level. We show in the appendix the results for Ireland.

Trends in imports *(MT)* are calculated assuming that the current value of GDP and of the import exchange rate is equal to its last 3 years average. Hypothetical imports *(MH)* are obtained in the same way, but use current GDP instead. Then, applying the same rationale as we did for exports, the term *(MT-MH)* represents

shocks in imports caused by changes in GDP. The variable *IMS (=Mt-MH)* captures the effect of exchange rate shocks.

Finally, interest payment trends were calculated assuming a constant interest rate. The benchmark interest rate is the 3 month Euribor for the year 1990. The interest trend *(JT)* tells us what would be the total interest paid, if interest rates remained the same as in 1990. We now present in the following tables, the decomposition of the current account, according to the method described above:

Table 4 – Decomposition of Portuguese current account. Numbers are period averages at annual rates.

	1977-1991	1992-1998	1999-2004	2005-2011
External shocks as % of GDP	-1.49%	-10.91%	-23.32%	-38.77%
Terms of trade effect (TOT)	1.09%	-6.78%	-17.941%	-36.78%
Export volume effect (EXV)	-2.59%	-4.13%	-5.38%	-1.99%
Policy responses as % of GDP	-1.49%	-10.91%	-23.32%	-38.77%
Price effect of export promotion (EXP)	-0.76%	4.49%	0.42%	1.19%
Price effect of import substitution (IMS)	-0.49%	-2.88%	-1.42%	-1.62%
Demand management (DEM)	-0.23%	-12.57%	-22.32%	-38.33%
External shocks as % of policy responses	100%	100%	100%	100%
Terms of trade effect (TOT)	59.86%	60.16%	76.19%	87.3%
Export volume effect (EXV)	40.13%	39.83%	23.80%	12.69%
Policy responses as % of external shocks	100%	100%	100%	100%
Price effect of export promotion (EXP)	188.69%	-50.93%	-1.86%	-1.87%
Price effect of import substitution (IMS)	-191.8%	36.35%	6.26%	8.86%
Demand management (DEM)	103.1%	114.58%	95.6%	93.005%

We chose to divide the analyzed period in four subsets, and present for each subset the yearly averages. The period 1992-1998

corresponds to the first step taken towards European monetary integration. In 1992 Portugal became member of the European monetary system, which was basically a fixed exchange rate regime, with some margin for fluctuations. The initial escudo margin of fluctuation was of 6% (up and down) in relation to all other member currencies of the EMS.

We should note that most countries belonging to the EMS had a margin of fluctuation of only 2.25% (up and down). In 1992-1993 there were systematical difficulties in keeping currencies inside the 2.25% bands, leading to reform of the EMS in 1994 which consisted in enlarging the fluctuation bands to 15%(up and down).

In 1999, EMS members fixed definitely their parities against a weighted basket composed of their own currencies, which was worth one euro from then on. Although the euro only came into circulation in 2002, it's reasonable to assume the beginning of the monetary union in 1999.

Portugal has been emerged in crisis almost since the beginning of the monetary union, first internal then external. The Portuguese situation has turned out to worsen as time goes by, especially after the world bust. So we decided to split the period belonging to the EMU in two, the first (1999-2004) incorporates a normal situation and a small recession, the second (2005-2011) is a period of bigger internal crisis followed by a world bust.

Observing external shocks in percentage of GDP we can see a continuous and growing deterioration of our terms of trade, especially after entering the EMU. In the core of *TOT* changes there are two effects. The first is that the value of imports grew much more than the value of exports. However, this growth is adjusted for interest payments and trend interest payments which is the second effect. For the last three periods this difference in debt and trend debt interest payments is bigger and grew faster than our trade deficit especially after 1999. These two effects go in different directions inside the terms of trade (value of imports is bigger than that of exports, but so is the trend debt bigger than actual debt payment), and the debt effect dominates causing the price effect of terms of trade to be negative. If Portugal would pay the same interest rates on debt as the rates in 1990, interest payments would explode. This is an advantage of belonging to the EMU, and is the main cause why the price effect of terms of trade is so negative.

Export volume as percentage of GDP has not varied much after entering to the EMS and during the first half of the EMU. The reason is that our partners imports have grown smoothly in that period, meaning that hypothetical exports are always above export

trends (*EXV* is negative). The exception is 2009 and 2010 where Portuguese partners imports contracted, and where Portuguese hypothetical exports were lower than export trends. That caused the period average to be less negative than in the first half of EMU membership.

Concerning policy responses in percentage of GDP, we start with demand management. The main reason why it is becoming more negative, especially after entry in the EMU is again related to interest payments. The current account trend deficit starts diverging significantly from the real current account deficit around 1995, due to the lowering of the interest rates in comparison to 1990. It "explodes" after the year 2000, especially in 2009 and 2010. This again reflects the capacity of Portugal to accumulate large quantities of debt given its access to low interest rates. However this has two sides. On one hand, it's good just *per se*. On the other hand, it might cause a sort of moral hazard problem, in the sense that countries have lower incentives to limit debt expansion. If Portugal left the Eurozone, debt service would become much more painful, maybe unsustainable.

The price effect of export promotion as a percentage of GDP should be tendentially positive. The reason is that, for a growing and stable world economy and growing export prices, current exports are bigger than hypothetical exports. This growth of prices should be faced in the context of Portugal as a price taker. Export price growth means that Portuguese goods are more valuable, not that Portuguese production is getting more expensive. As it is reported in most periods, the *EXP* is positive. It can be negative if there are some unexpected export price shocks, like oil shocks which happened in the period 1977-1991. After being part of the EMU, our export prices show a much more stable behavior, actually presenting some decreases, which contributed to low levels of *EXP* after 1999.

Opposed to export promotion, the price effect of import substitution should be tendentially negative. Similarly to hypothetical exports, hypothetical imports only take into account lagged import exchange rates, which is a measure calculated as import prices divided by nominal exchange rates. We estimated that the import exchange rate affects negatively imports and hypothetical imports, and also that it has a negative trend over time. As an example, after entering the EMU import exchange rate decreased almost 15% between 1999 and 2010. For this reason hypothetical imports are usually lower than current imports(so *IMS* is negative). Import exchange rate getting smaller over time means that imports are getting cheaper compared to goods produced

inside. So the import exchange rate is contributing to import substitution of national production. In simple terms, it is getting cheaper to import rather than produce. Nevertheless, this tendency is smaller after the euro entry in circulation than before (1992-1998) which is good news

Now that the basic mechanics of the variables behavior are explained we will focus on the more important point, the dynamics of current account adjustment. To see how current account adjusts, we express external shocks as percentage of policy responses and vice versa.

External shocks capture effects of exogenous variables, such as prices and interest rates defined in external markets. The interpretation of the calculated shocks is tricky. External shocks that have a negative sign as percentage of GDP are in fact a positive shock. In fact the way we measure terms of trade shocks and export volume shocks, delivers the result that Portugal has suffered positive shocks most of the time. First Portuguese bigger partners imports have grown systematically, which is a positive shock on Portuguese export volume *(EXV)*. This shock is biggest in the period of 1999-2004. The other shock has to do with the way we measure terms of trade. If we measured them without taking into account interest trends, terms of trade would suffer a negative shock. However, by including a hypothetical situation where Portuguese debt would be more "expensive", we see that European integration constitutes a positive shock. The reduced debt service compensates the increased trade deficit that coincides with European integration. However, since trade deficit is related to debt accumulation, we cannot say Portugal is better protected against negative external shocks inside the Eurozone.

These two types of shocks seem to differ in nature before and after Portugal entered the EMU. In the first two periods that range from 1977 to 1999, terms of trade shocks represented around 60% of policy responses. However, after 1999 terms of trade shocks kept rising in percentage of external shocks. Once again the Eurozone is to "blame" for the lowering of interest rates, and lower interest payments on debt, allowing Portugal to live with bigger amounts of debt and a trade deficit bigger than otherwise would be possible.

The counterpart of terms of trade, Export volume effect as a percentage of policy responses, obviously has to go down. We observe that after entering the EMU, *EXV* felt vigorously. This reflects that foreign demand for Portuguese exports has come down in importance when compared to terms of trade effects especially in the second half of membership, influenced by the world bust.

In terms of policy responses, we can see that adjustments through export promotion and import substitution have lost magnitude as time went by. These two variables always have different signs, but both tend to very low levels. On the other hand, demand management maintained a weight on current account adjustment along all periods of around 100%, meaning that in the last periods almost all adjustment has been done through this variable.

In the case of the price effect of export promotion, we can interpret it as the price competitiveness effect on export promotion. *EXP* grows if export prices go up, and the opposite is also true. Exporting more is one way of compensating for adverse external shocks, which has lost importance over time. In fact export prices have risen, but adjustment through exports has contracted as a percentage of external shocks. The negative sign means that export promotion is contributing negatively to the external shocks, or that the positive shocks we suffered in most periods don´t come from export promotion.

The price effect of import substitution behaves in a similar way. Its weight as percentage of external shocks has diminished over time and became positive in the last three periods. It is important to note that after 1999 the price effect of import substitution is bigger in absolute value than the price effect of export promotion. This differential means that the growth of traded goods prices is aggravating Portuguese trade deficit.

Finally demand management became the main instrument of stabilization of the current account after 1992. Its magnitude did decrease after 1999, but still it represents almost 100% of external shocks. In the period starting on 2005 there is a slight decrease of demand management as percentage of external shocks compared to the 1999-2004 period. The reason is that the slow down and recession of Portuguese GDP in the second half of Eurozone membership contributed negatively to imports. This decrease helped to compensate the “explosion” of trend interest payments in the second half of Eurozone membership. Still we can conclude that after the euro came into circulation, Portugal relies more on demand management than on export promotion or import substitution to adjust for external shocks.

Now for the sake of comparison, we present the decomposition of the Irish current account, using the same technique we used for Portugal.

Table 5 – Decomposition of Irish current account. Numbers are period averages at annual rates.

	1985-1991	1992-1998	1999-2004	2005-2011
External shocks as % of GDP	2.864%	6.35%	4.11%	-8.69%
Terms of trade effect	-1.406%	-0.51%	-2.38%	-9.62%
Export volume effect	4.27%	6.86%	6.49%	0.93%
Policy responses as % of GDP	2.864%	6.35%	4.11%	-8.69%
Price effect of export promotion	6.003%	9.02%	36.16%	-7.15%
Price effect of import substitution	-16.49%	-21.46%	-26.2%	-15.35%
Demand management	13.35%	18.79%	-5.84%	13.82%
External shocks as % of policy responses	100%	100%	100%	100%
Terms of trade effect	-148.35%	-13.37%	526.51%	42.07%
Export volume effect	248.35%	113.37%	-426.5%	57.92%
Policy responses as % of external shocks	100%	100%	100%	100%
Price effect of export promotion	363.88%	104.21%	-5766.39%	132.82%
Price effect of import substitution	-952.25%	-411.09%	3918.73%	-82.33%
Demand management	688.36%	406.88%	1947.66%	49.5%

It is interesting to note that, as percentage of GDP, export volume effect is positive along all periods, meaning Ireland is losing export volume. However, the price effect of export promotion is also positive in the first three periods and bigger than the volume effect. This means that Ireland is increasing the price of its exports, at a higher rate than it loses volume, resulting in an increase in export value. The exception is the last period.

Also, we can check that the evolution of Irish import exchange rate contributes to increasing imports (negative price effect of import substitution as a percentage of GDP). This value takes the less negative value in the last period, caused by the lowering of unit labor costs in the period last years.

Demand management in percentage of GDP is only negative in the first half of Eurozone membership. This is rooted in an expansion of internal demand that affected imports.

The policy responses as a percentage of external shocks had a huge boom in the first half of Eurozone membership. The cause is that in some years of this period, the Irish economy suffered very small external shocks. Its volume of exports did decrease but not much. Its trend debt did not diverge much from actual debt and its export value grew at a similar rate to its import value. Contrasting to this, the price of Irish exports did grow at high rates and the import exchange rate also highly decreased, leading to extremely high values of policy responses as percentage of external shocks.

Conclusion

In this work project we proposed to analyze the evolution of Portuguese competitiveness along the period 1977-2010 and the pattern of stabilization of the current account in the same period. Bigger emphasis was put on the comparison of periods after and before Portuguese adoption of the Euro in a tentative to uncover effects that monetary union might have had on the Portuguese economy. Ultimately, a comparison with Ireland was done. Its purpose was to analyze how a "successful" country behaved in the same conditions than Portugal, how different was the evolution of its competitiveness and adjustment dynamics.

According to general monetary union theory, joining a monetary union changes the framework in which a country manages its competitiveness and performs current account adjustments. The objective of the work was to check if abdicating of monetary and exchange rate policy had any effects on the studied variables.

Analyzing the evolution of Portuguese competitiveness indicators we ca see that Portugal lost nominal competitiveness (real exchange rate and relative consumer prices) after joining the Eurozone, contrasting to the periods before. Also, the real unit labor costs did fall in the first half of membership, while in the second half they grew but still less than in Ireland. Also, relative unit costs did grow less than in Ireland after 2001. This suggests that the euro brought difficulties for Portugal in managing nominal competitiveness, which is predictable for a country used to competitive devaluations in the past. The euro seems not to have a negative effect on labor and capital costs. Actually, the latter perform better than Ireland after the euro came into circulation, and better than most periods before joining the Eurozone. Despite this, empirically we reject any significant effect of the euro on any of the competitiveness indicators, though we recognize a need for further empirical work.

Concerning the current account analysis, we conclude that the dimension of Portuguese debt would most probably be unsustainable outside of the Eurozone. Adoption of the euro was reflected in more positive shocks for Portugal, given the access to lower interest rates and the integration of Eurozone markets that allowed an expansion of export volume. The further integration of European markets, coincided with an increase of the price of Portuguese exports, and with a surge in internal demand, which also accelerated import value growth. Nevertheless, these two effects are of very small magnitude in adjusting for external shocks when compared to periods prior to the euro. Greater role in adjustment to external shocks has been assumed by demand management after 1999, which might be associated with the growth of internal demand, and with the impossibility of affecting the nominal value of imports and exports.

In the end we cannot say surely whether adopting the euro was a good decision or not, although we believe that we are better off inside the Eurozone. It's unquestionable that adopting the single currency brought innumerous benefits for the Portuguese economy. It´s also unquestionable that it introduced several constraints in terms of macroeconomic policy. That loss of monetary policy enforced the importance of fiscal policy, price stability and wage restraint, three topics in which Portugal did not perform so well compared to its partners after adopting the euro. With economic integration comes increased competition across borders, promoting an increase of trade deficits for a country that needs to reform several sectors of society in order to gain competitiveness. In our opinion, the Euro is not to blame for the problems that came along with it and abandoning it now would be dangerous. The lack of competitiveness, current account deficit and internal recession (before the world bust) are the result of wrong policies, the euro just exposed our weaknesses. The first best solution is to seize all opportunities offered by the single currency, to reform our society and adapt our policy making to the monetary union landscape.

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Appendix

A. Competitiveness indicators:

Table A.1 – Portuguese and Portuguese trading partners indicators of competitiveness (period averages at annual rates)

	Portuguese RULC	Portuguese trading partners RULC	Portuguese RUC	Portuguese trading partners RUC
1977-1985	-4.27%	-0.79%	----------	----------
1986-1990	-0.95%	-0.38%	11.79%	----------
1991-1995	1.26%	-0.31%	12.7%	4.36%
1996-2001	0.45%	-0.35%	5.69%	2.85%
2002-2005	-0.14%	-0.77%	6.57%	4.84%
2006-2010	0.75%	0.057%	6.45%	7.56%

Table A.2 – Irish and Irish trading partners indicators of competitiveness (period averages at annual rates)

	Irish RULC	Irish trading partners RULC	Irish RUC	Irish trading partners RUC
1977-1985	-0.83%	-0.56%	----------	----------
1986-1990	-1.07%	-0.07%	4.55%	----------
1991-1995	-1.16%	-0.49%	1.67%	3.16%
1996-2001	-2.48%	0.06%	4.32%	3.83%
2002-2005	0.17%	-0.64%	9.24%	0.49%
2006-2010	1.73%	-0.22%	13.31%	4.94%

B. determinants of competitiveness

We estimated a model of the determinants of competitiveness which we present below. In particular, we tried to model the effect of adopting the Euro on competitiveness. So we used a dummy variable,

Euro, which takes value one from 1999 to 2010 and zero for the rest of the period. Also we used *Un*, which is the unemployment rate in percentage and *NAWRU* (the non accelerating wage rate of unemployment). In addition, *Gov* is government expenditures as percentage of GDP and *Res* is reserves as percentage of GDP. *Interest* is the short run interest rate given by the 3 month treasury bill (from 1985 to 1993) and by the 3 month interbank rate (from 1993 to 2010). We used yearly data for the period 1977-2010 except for RUC where data was only available from 1985 to 2008. Since the four competitiveness indicators presented unit roots, we estimated them in first differences. However, we didn't use regressor first differences. Thus, we are estimating how regressor magnitude contributes to changes in competitiveness, measured by the four indicators.

Table B.1 – Portuguese determinants of competitiveness

	RULC	RUC	ECPI	E
Constant	-0.02	2.29	-0.52	-1.75
t-stats	(-0.21)	(2.21)	(-3.69)	(-4.31)
Euro	-0.05	0.004	0.03	0.16
t-stats	(-2.00)	(0.15)	(1.25)	(2.16)
Un	-0.11			
t-stats	(-4.81)			
Un-NAWRU		-0.14	0.09	0.28
t-stats		(-3.44)	(1.89)	(2.12)
Gov	0.18	0.19	-0.29	-0.97
t-stats	(2.68)	(2.25)	(-3.97)	(-4.51)
Res	-0.018			
t-stats	(2.01)			
Interest		0.06		
t-stats		(2.62)		
R^2	0.48	0.58	0.51	0.51
Durbin watson	1.86	2.40	1.59	1.03

We conclude that monetary union is not contributing to a loss of competitiveness. In fact, our estimates show *Euro* to influence positively competitiveness growth in *RULC*, *ECP*I and *E*. It seems to only hurt it through *RUC*, but the coefficient is not significant.

Un and *Un-NAWRU* have the predicted effect according to classic theory, in the sense that higher values of unemployment or values above the equilibrium rate should contract wage and price growth thus improving competitiveness. Our coefficient estimates for *Un* and *Un-NAWRU* agree with the theory and they are all significant.

Our estimates show that government expenditure hurts competitiveness growth. This agrees with theory, where a rise in government expenditure can cause upward wage pressure and

inflationary pressure, which would be reflected negatively on our indicators. All coefficients on *Gov* are significant. Finally we included *Res* and *interest* on only one regression each, for econometric and economic reasons. There seems to be a loss of reserves associated with growing real unit labor costs. Higher interest rates are associated with an increase in capital costs.

Besides the reported Durbin Watson tests, we rejected higher orders of serial correlation through the Breush-Godfrey LM test in all regressions. However, when estimating *RUC* we couldn't reject the presence of heteroskedasticity so we used Newey-West standard errors.

C.Elasticities

When estimating Irish import and export elasticities, we came across the same problem as with Portuguese ones, so we estimated a vector error correction model. All elasticities are significant at the 5% level. Irish export and import elasticities are given by the following two equations:

$$X_t = -8.34 + 0.77\ PX_t + 0.88\ X^*_t \qquad M_t = -3.53 + 1.782\ Y_t - 0.303\ EM_t$$